

## Total Ionic Equations and Net Ionic Equations

**Total Ionic Equation** – an equation that shows the \_\_\_\_\_ of soluble ionic compounds into their respective ions.



Total ionic equation: \_\_\_\_\_

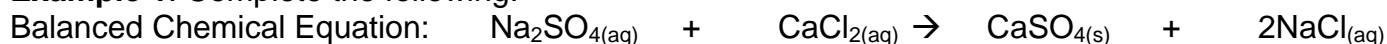
**Spectator Ions** – ions that are \_\_\_\_\_ in a solution but are not involved in the chemical reaction (spectator ions appear on both sides of the equation, and they remain dissolved the whole time)

Spectator ions in above reaction: \_\_\_\_\_

**Net Ionic Equation** – an equation showing \_\_\_\_\_ involved in the chemical change.

Net Ionic Equation: \_\_\_\_\_

**Example 1.** Complete the following:



Total Ionic Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

**Example 2.** Write the total ionic equation and the net ionic equation for the reaction of magnesium chloride and silver nitrate. Follow the steps outlined below in the summary.

Word Equation: \_\_\_\_\_

Balanced Chemical Equation: \_\_\_\_\_

Total Ionic Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

### Summary – Writing Net Ionic Equations

1. Write the double displacement reaction as a word equation.
2. Using solubility rules, determine whether the products have a high or low solubility in water.
3. Write a chemical equation for the reaction, including states.
4. Balance the equation
5. Rewrite the equation, with all ionic compounds that are soluble in water separated into their respective ions. This equation is the total ionic equation
6. Cancel out identical amounts of identical ions that appear on both sides of the equation. (these are the spectator ions)
7. Write the net ionic equation, reducing coefficients if necessary.

## Writing Total Ionic Equations and Net Ionic Equations

For each of the examples below, do the following:

- Complete the word equation by predicting the products of the double displacement reaction.
- Use your solubility rules to find out if one of the products will form a precipitate.
- If a precipitate forms, then write the balanced chemical equation **with states** indicated. If NO PRECIPITATE FORMS, then write **no reaction**, and you're done (leave other parts blank)
- Where a precipitate forms write the total ionic equation.
- Cancel out spectator ions and write the net ionic equation. Reduce coefficients if necessary.

### 1. zinc chloride + sodium phosphate →

Which product will form a precipitate? \_\_\_\_\_

Balanced Equation: \_\_\_\_\_

Total Net Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

### 2. lead (II) nitrate + sodium sulfide →

Which product will form a precipitate? \_\_\_\_\_

Balanced Equation: \_\_\_\_\_

Total Net Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

### 3. magnesium chloride + iron (III) nitrate →

Which product will form a precipitate? \_\_\_\_\_

Balanced Equation: \_\_\_\_\_

Total Net Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

### 4. barium chloride + silver nitrate →

Which product will form a precipitate? \_\_\_\_\_

Balanced Equation: \_\_\_\_\_

Total Net Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_

### 5. Ammonium sulfate + barium chloride →

Which product will form a precipitate? \_\_\_\_\_

Balanced Equation: \_\_\_\_\_

Total Net Equation: \_\_\_\_\_

Net Ionic Equation: \_\_\_\_\_

Spectator ions: \_\_\_\_\_